Remarks

Claims 1-37 are now pending in this application. Applicants have amended claims 1 and 3-6 and added new claims 32-37 to clarify the present invention. Applicants respectfully request favorable reconsideration of this application.

Claims 7-31 stand as withdrawn from consideration by the Examiner as being directed to non-elected inventions.

Applicants have overcome the rejection under 35 U.S.C. § 112, first paragraph, by amending the claims to delete the term "such as". Applicants have added claims to recite the subject matter described by the term. Accordingly, Applicants submit that the claims comply with 35 U.S.C. § 112, first paragraph, and respectfully request withdrawal of this rejection.

The Examiner rejected claims 1 and 2 under 35 U.S.C. § 102(b) as being anticipated by Kordina et al. The Examiner rejected claims 1-6 under 35 U.S.C. § 102(b) or, in the alternative, under 35 U.S.C. § 103(a) as being unpatentable over U.S. patent 5,709,745 to Larkin et al. in view of U.S. patent 5,043,773 to Precht.

Niether Kordina et al. nor Larkin discloses the present invention as recited in claim 1 since, among other things, neither reference discloses a uniform single crystal of silicon carbide in the form of a wafer. Both Kordina et al. and Larkin disclose an epitaxial layer on a substrate that together form a wafer.

Larkin discloses a substrate 24 with a epilayer grown on top of the substrate. The Examiner asserts that Larkin et al. in Fig. 4 illustrates and at col. 14, lines 44-48 describes, "6H-Sic epilayers grown on a 6H-SiC polytype substrate". However, Fig. 4 and this passage relate to the properties of an epilayer grown on the substrate, and not the substrate itself. Along these lines, in this passage, Larkin et al. states that, "the type of SiC epilayer grown on the substrate can be controlled by nucleation sites and the polytype of the substrate". Therefore, Larkin et al. is pointing out that the substrate is merely a starting point and carrier of the epitaxial layers. It is incorrect to assume that substrate and epilayer are the same and that they have the exact same properties.

Additionally, an epitaxial layer according to the claimed invention is not grown on a substrate that already has the exact same properties as the epitaxial layer. If the substrate already had he properties of the epitaxial layer, there would be little meaning to make effort to grow the epitaxial layer thereon. The Examiner asserts that "homoepitaxial layers would have the same crystal structure and elements as the substrate". This is not true if it is meant that the epitaxial layer and the substrate are of the exact same material. By homoepitaxial growth is simply meant that the polytypes of substrate and epilayer are the same. This is supported by Larkin, for example, at col. 14, lines 47-48, which states, "As illustrated in FIG. 4, 6H--SiC epilayers 40 are grown on a 6H-SiC polytype substrate 24, which is referred to as homoepitaxial growth." Furthermore, at col. 19, lines 24-25, Larkin states, "a commercial 6H-SiC substrate cut from a boule was used". Clearly, a boule is not equivalent to an epitaxial layer, nor has the properties of the epitaxial layers disclosed by Larkin et al.

In view of the above, Larkin et al. discloses a substrate that has been cut/sliced from a boule. The substrate is not the same material as an epitaxial layer grown thereon. As a consequence, Larkin et al. does disclose slicing a crystal into a substrate, and certainly not into a wafer. A wafer is a piece of material for fabrication of integrated circuits therein. Since the substrate disclosed by Larkin et al. is used to support an epitaxial layer, it is the epitaxial layer together with the substrate that constitute a wafer in Larkin, not the substrate alone.

In view of the above, neither Kordina et al. nor Larkin et al. discloses all elements of the present invention as recited in claims 1-6 and 32-37. Since Kordina et al. nor Larkin et al. discloses all elements of the present invention as recited in claims 1-6 and 32-37, the present invention, as recited in claims 1-6 and 32-37, is not properly rejected under 35 U.S.C. § 102(b). For an anticipation rejection under 35 U.S.C. § 102(b) no difference may exist between the claimed invention and the reference disclosure. *See Scripps Clinic and Research Foundation v. Genentech, Inc.*, 18 U.S.P.Q. 841 (C.A.F.C. 1984).

Along these lines, anticipation requires the disclosure, in a cited reference, of each and every recitation, as set forth in the claims. *See Hodosh v. Block Drug Co.*, 229 U.S.P.Q. 182 (Fed. Cir. 1986); *Titanium Metals Corp. v. Banner*, 227 U.S.P.Q. 773 (Fed. Cir. 1985); *Orthokinetics, Inc. v. Safety Travel Chairs*, Inc., 1 U.S.P.Q.2d 1081 (Fed. Cir. 1986); and *Akzo N.V. v. U.S. International Trade Commissioner*, 1 U.S.P.Q.2d 1081 (Fed. Cir. 1986).

The combination of Larkin et al. and Precht does not suggest the present invention as

recited in claim 1 since, among other things, Larkin et al. does not suggest the present invention as described above. Conventional wafers, that is, with the crystal in the form of an epilayer on top of a conducting substrate actually teach away from the present invention as recited in amended claim 1. The structures suggested by the cited references suffer from the problem that the substrate introduces an undesired resistance. A person skilled in the art facing this problem would seek to reduce the resistance in the substrate but keeping the epitaxial layer. This since an epitaxial layer on a substrate was the only known solution providing the other desired properties, which are more important than lowering the substrate resistance. Removing the substrate would not be a viable option to a person skilled in the art for the above reasons. The cited references do not suggest a single layer wafer of a crystal having the desired properties.

The present invention as recited in claim 1 provides a crystal having desired properties that can be used standalone as an "active" substrate, that is, as a single layer wafer, instead of, as in the prior art, a (slow grow) epitaxial layer with desired properties grown on top of a supporting (quick grow) substrate. For example, even in the case of a conventional wafer with a Sic epitaxial layer grown on a substrate, an epilayer that is at least 100 μm (which typically is required to be able sustain a lower range of high voltages), requires about 24 hours of growth. To compensate for material losses during cutting of such epilayer into to a single layer wafer of the same thickness, the grown layer needs to he magnitudes thicker.

In practice, a few millimeter thick layer is required for cutting into wafers. Hence, using conventional growth of epilayers to produce a wafer would require growth during several days or even weeks, which apparently cannot be commercially motivated, and hence no wafer consisting

of a crystal according to present invention as recited in claim 1 has been known. This is further supported by the non-existence of such wafer before the present invention. In fact, the present application has overcome a prejudice that wafers according to claim 1 could not be obtained because of limitations inherent to the material per se and to prior art growth techniques.

In view of the above, the cited references, whether considered alone or in combination, do not disclose or suggest patentable features of the present invention as recited in claims 1-6 and 32-37. Therefore, the cited references, whether considered alone or in combination, do not anticipate the present invention or make the present invention obvious. Accordingly, Applicants submit that the claimed invention is patentable over the cited references.

If an interview would advance the prosecution of this application, Applicant respectfully urges the Examiner to contact the undersigned at the telephone number listed below.

The undersigned authorizes the Commissioner to charge insufficient fees and credit overpayment associated with this communication to Deposit Account No. 22-0261.

Respectfully submitted,

Date: 2/15/08

Eric J. Franklin, Reg. No. 37,134
Attorney for Applicants
Venable LLP
575 7th Street, NW
Washington, DC 20004
Telephone: 202-344-4936